

Teleconnections between the Southern Ocean Sea Ice Cover And the Southern Oscillation

Ron Kwok and Josefino. C. Comiso*
Jet Propulsion Laboratory
California Institute of Technology
4800 Oak Grove Drive
Pasadena, CA 91109
Ph. (818) 354-5614 FAX: (818) 393-3077
Email: Ron.Kwok@jpl.nasa.gov

*Laboratory for Hydrospheric Processes
Goddard Space Flight Center
Greenbelt, MD 20771

We have explored the teleconnections between the Southern Oscillation and the atmosphere, ice and ocean conditions south of 50 deg. These conditions are described by fields of sea level pressure (SLP), near surface air temperature (SAT), sea ice edge (SIE), sea ice motion (SIM) and sea surface temperature (SST). We characterize the relationships by examining: 1) the behavior of the above fields to extremes in the Southern Oscillation index (SOI); 2) the correlation of the above fields to the SOI; and; 3) the connections of these phenomena to the Antarctic Circumpolar Wave. In all cases, we find the correlation between the time series of SOI and the SLP, SAT, SIE, SIM, and SST fields to be especially significant in the Bellingshausen and Amundsen Seas. The positive phases of the SOI are associated with lower SLPs, lower SATs, and cooler SSTs around this area. The positive extremes of SOI show an anomalous low centered between the two seas resulting in different changes in the SIE due to differential forcing of the sea ice edge. This suggests that anomalies in the Southern Ocean are associated with SOI and that the resulting anomalies are propagated around the Antarctic Continent as part of the ACW.